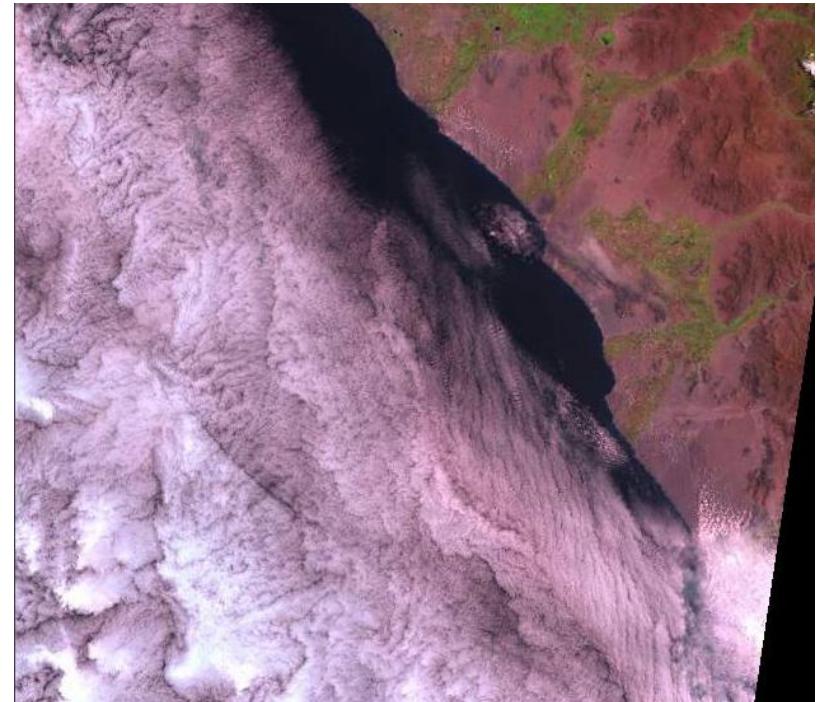


LTAP Goals

Seasonally refresh the US-held archive, with *Substantially cloud-free* observations for all *land areas* of the Earth . . .
with maximum radiometric fidelity

Land

- Earth 7/10's water
- Landsat Worldwide Reference System (WRS)
 - 185 km by 170 km grid system
 - ~9000 land WRS locations
- Any day there 850 – 900 WRS observed
 - L7 (250 US, ICs 200+)
 - L8 (400 US&IC)

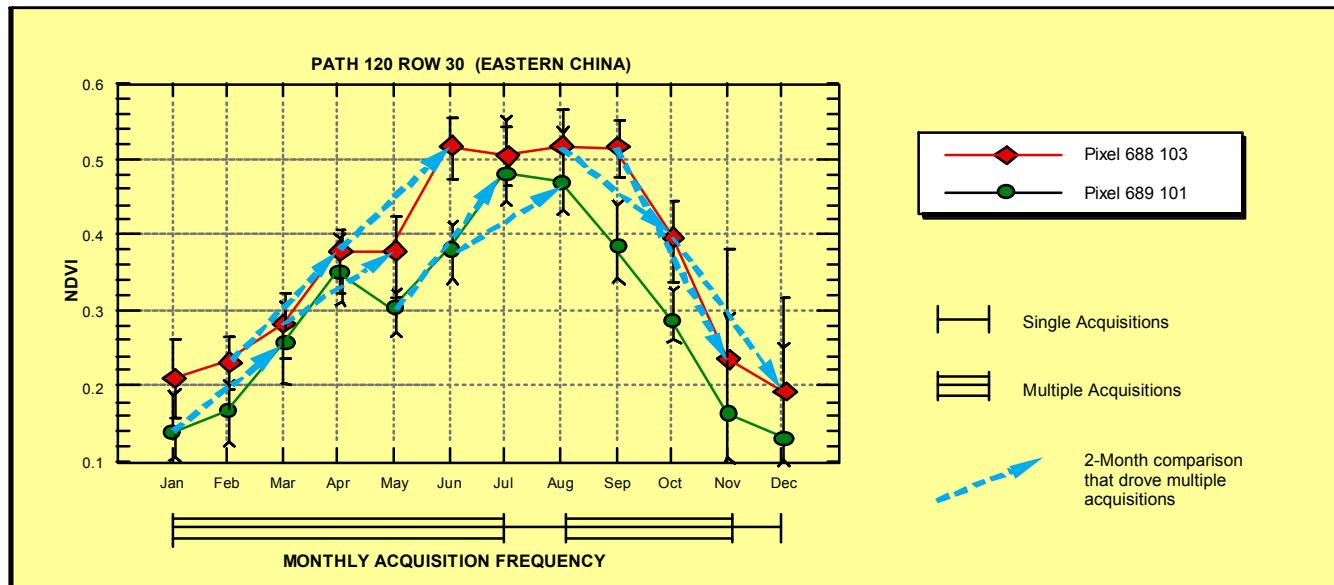


Seasonality

Land Annual Cycles

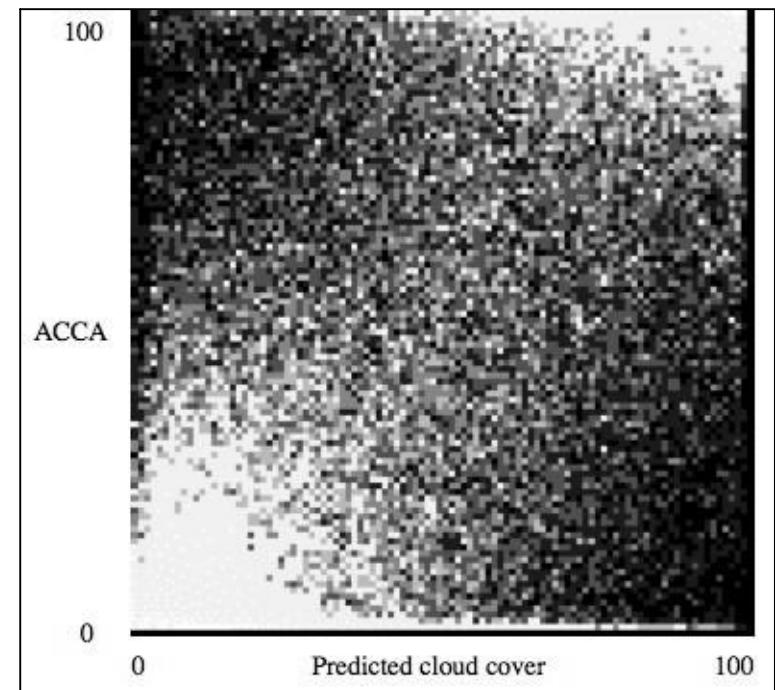
- Earth Orbital Cycle (Solstices, Equinoxes)
- Climate Annual Cycle
- Vegetation Annual Cycle

Landsat spectral bands (green leaf)



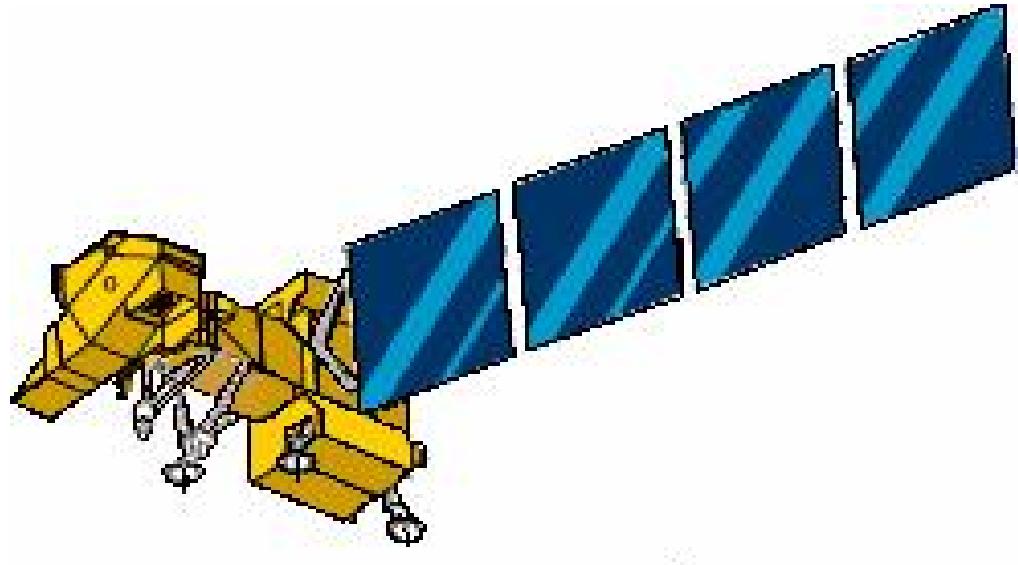
Cloud Avoidance

- Climatology vs Prediction
 - ISSCP vs MODIS Terra
 - NCEP or others
- Acquire all?
 - NCEP etc Boreal/Tropics problems
- ACCA Validation
- Seasonality/Cloud Interactions
 - Clouds dominate



Observatory Constraints

- Power
- Heat
- Storage
- Downlinks
- Vendor limits?

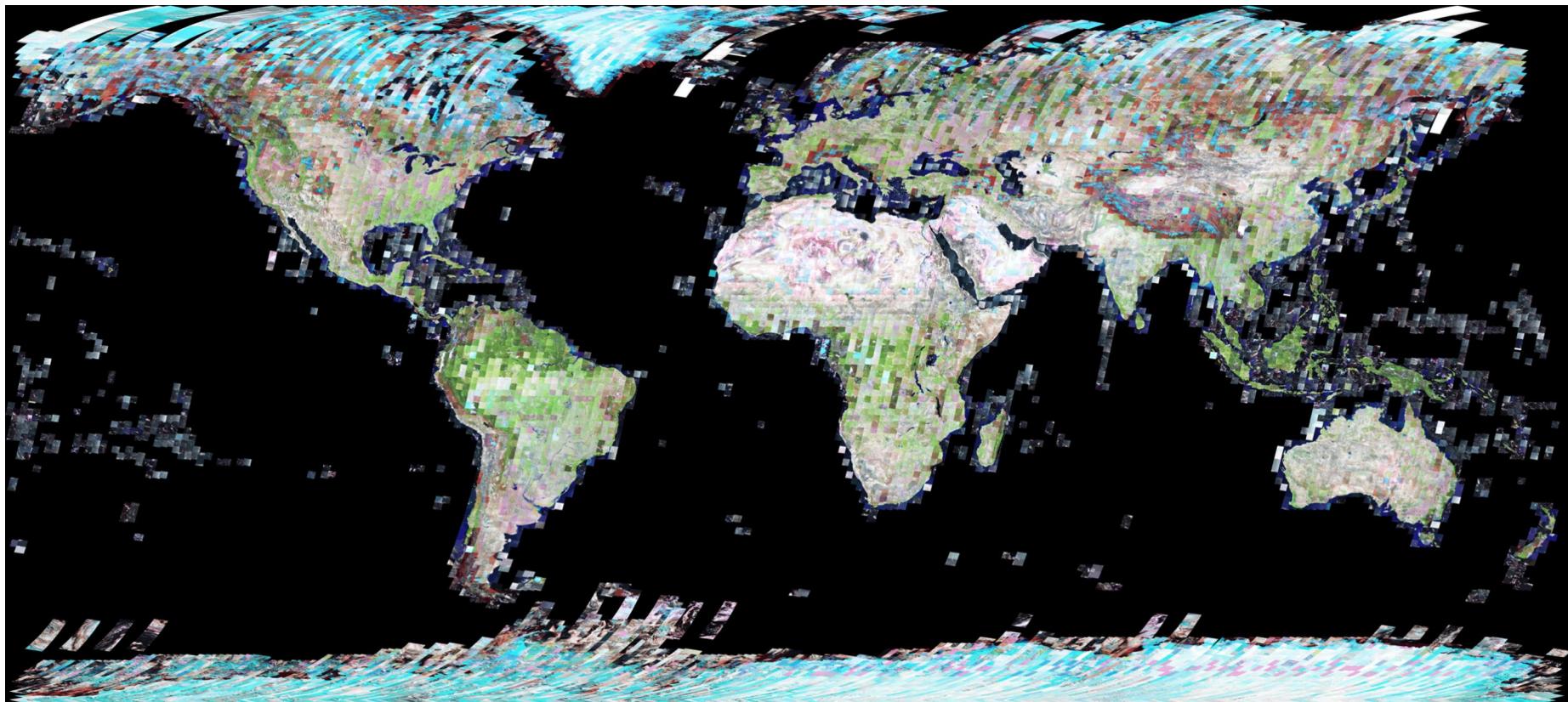


LTAP-7: Campaigns

- **Cal/Val**
 - Cal/Val-EOS
 - Cal/Val-Uniform Radiance
 - Cal/Val-Geometry (new)
 - MODIS Fire (obs.)
- **Forest**
 - Boreal
 - Boreal-East Eurasia
 - Boreal-West Eurasia
 - Boreal-Siberia Study (obs.)
 - Tropical
 - Rainforest-GOFC
 - Rainforest-Survey
- **Islands**
- **Land Snow/Ice**
 - Antarctica
 - Glacier
 - Glacier-Arctic
 - Glacier-NH Mid-latitude
 - Glacier-Equatorial
 - Glacier-SH Mid-latitude
- **Reefs**
 - Reef-Quarterly (obs.)
 - Reef-Bleaching Points (obs.)
- **Volcanoes**
 - Volcano-Russia and Alaska (obs.)
 - Volcano-non-AVO (obs.)

Obs. = currently an obsolete group

LTAP Achieves the Global Landsat Goal



from Jay Feuquay, USGS EROS Data Center, Sioux Falls, SD -- a mosaic of jpeg browse images

L7 LTAP Validation Outcome (2002)

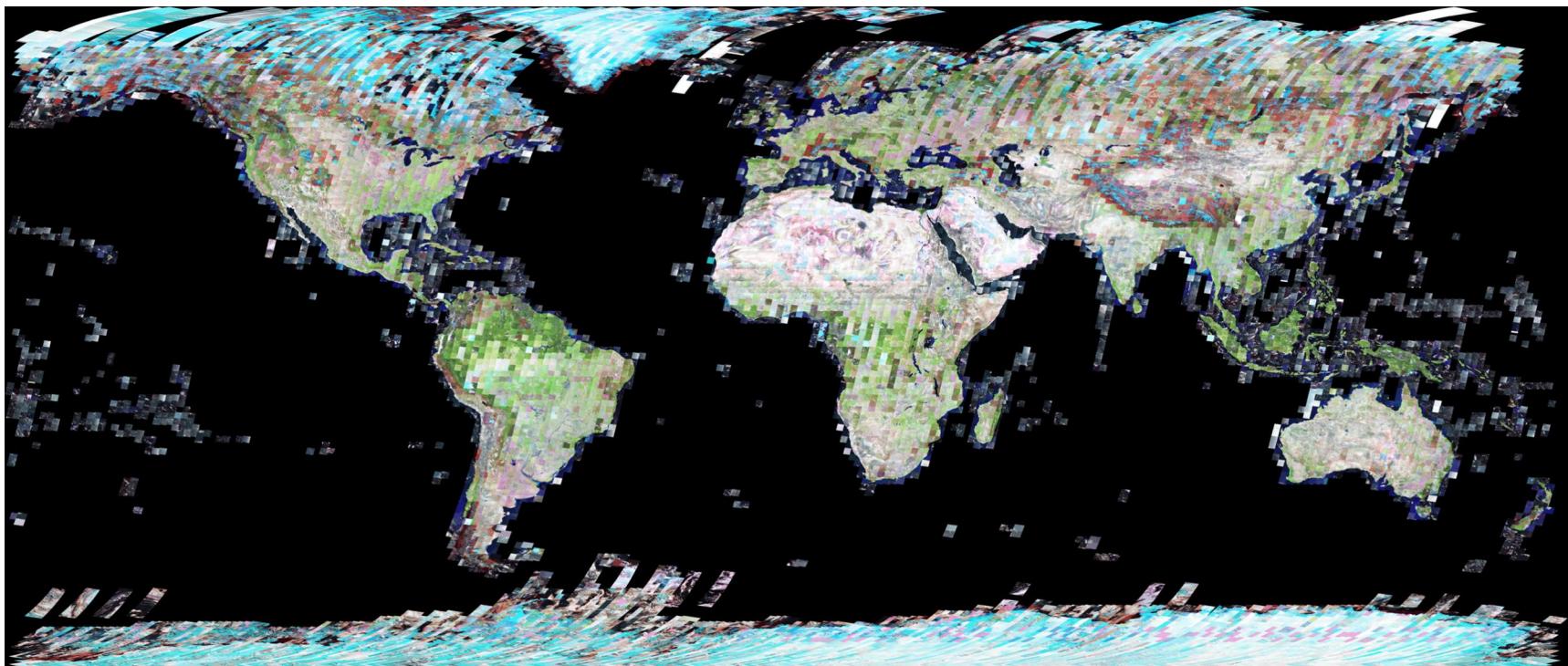
Recommendations

- Reduce desert and boreal winter
- more boreal summer and tropical (lower-cloud)

Updates

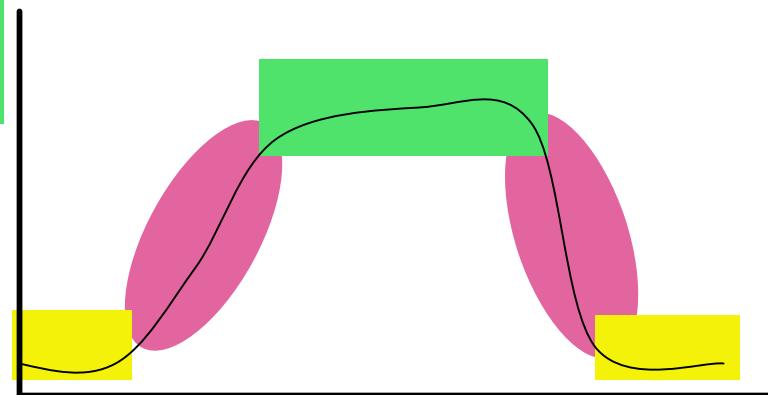
Seasonality

ACCA land mask
Image composite cloud clearing



LTAP-7 Lessons Learned: Seasonality and NDVI

- Acquire always during period of peak greenness
 - First derivative of NDVI
 - Need to update NDVI source - newer AVHRR, MODIS
- Avoid the slopes (green-up and die-down)
 - Hard to tell where on the slope your acquisition is
- Acquire once during senescence



LTAP-7 Lessons Learned: Clouds

- Clouds drive LTAP
- Regional performance uncertain
 - Polar and Tropical situations

